

CANCER IN VERMONT

Technical Notes

VERMONT CANCER REGISTRY

The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed or treated in Vermont since January 1, 1994. The registry enables the state to collect information on new cases (incidence) of cancer. Previously, the state only kept records on deaths from cancer. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Suggested Citation: Vermont Department of Health Cancer Registry, 1997-2001. The Vermont Cancer Registry can be contacted at 802-865-7749.

DATA COLLECTION

The Vermont Cancer Registry Law (18 VSA §§ 151-157) requires physicians and hospitals to report information on all cases of cancer and benign brain-related tumors they diagnose or treat in Vermont. Through interstate agreements, information on Vermonters diagnosed or treated in other states is also included in Vermont's registry. The registry does not collect information directly from patients.

DATA CONFIDENTIALITY

State law requires reporting for public health purposes, and does not allow people to opt out of the reporting. However, all information that is reported under the Vermont Cancer Registry Law, which could possibly be used to identify an individual Vermonter, is kept confidential and privileged by the Vermont Cancer Registry. This specifically includes identifying information regarding individual patients, health care providers and health care

facilities. The law permits disclosure of certain confidential data to other cancer registries and federal cancer control agencies to collaborate in a national cancer registry and to health researchers for cancer control and prevention research studies. However, strict requirements, including prior approval of the researcher's academic committee for the protection of human subjects, must be met.

Public data releases, such as published statistical reports, are carefully designed in order to provide data to the fullest extent possible while still realizing the mandate to protect patient confidentiality.

VERMONT VITAL STATISTICS

In Vermont, towns are required to file certified copies of death certificates with the Department of Health for all deaths occurring in their jurisdictions. The Health Department is responsible for maintaining the vital statistics system.

BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM

Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey.

AGE ADJUSTMENT

All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

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CONFIDENCE INTERVALS

A confidence interval is a range of values within which the true rate is expected to fall. If the confidence intervals of two groups (such as Vermont and the U.S.) overlap, then any difference between the two rates is not statistically significant. All rates in this report are calculated at a 95 percent confidence level. For example, the age-adjusted Vermont male colorectal cancer incidence rate is 67.0 (62.5, 71.7) per 100,000 population. There is a 95 percent chance that the true age-adjusted Vermont male colorectal cancer incidence rate is between 62.5 and 71.7.

INCIDENCE

Incidence refers to the number or rate of newly diagnosed cases of cancer. Rates are age-adjusted to 2000 U.S. standard population and exclude basal cell and squamous skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder. Rates based on 5 or fewer cases are not calculated.

MORTALITY

Mortality refers to the number or rate of deaths from cancer. Rates are age-adjusted to 2000 U.S. standard population. Rates based on 5 or fewer cases are not calculated. Cancer mortality site groupings are defined by National Center for Health Statistics and based on ICD-10 classification. Cause of death before 1999 was coded according to ICD-9; beginning with deaths in 1999, ICD-10 was used. Comparability ratios were applied to pre-1999 mortality rates (except testis and thyroid) to allow for

continuity in trends.

VERMONT / U.S. COMPARISON

U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.1 percent of the total Vermont population, compared with the total U.S. non-white population of 19.6 percent in 2004. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

RATE COMPARISONS

To determine if there is a statistically significant difference between cancer incidence in Vermont compared to the U.S., the Vermont rate is compared to the U.S. SEER rate. If the SEER rate falls within the confidence interval for the state rate, it suggests that the rates are not statistically different from one another. For example, the Vermont female lung cancer incidence rate is 52.3 (48.9, 55.9) per 100,000 population, and the SEER rate is 53.5. Since the SEER rate is found within the confidence interval (48.9, 55.9) of the Vermont rate, no statistical difference exists between the two rates.

SMALL NUMBERS

With very small counts, it is often difficult to distinguish between

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random fluctuation and actual health issues. According to the National Center for Health Statistics, considerable caution must be observed in interpreting the data when the number of events is small (perhaps less than 100) and the probability of such an event is small (such as being diagnosed with a rare disease).

The limited number of years of data in the registry and the small population of the state require policies and procedures to prevent the unintentional identification of individuals. To protect patient privacy, county-specific data are published only for commonly diagnosed cancer sites. Data on rare cancer sites, race, and other variables that could potentially identify individuals are not published.

U.S. MORTALITY RATES

The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Based on the U.S. Public Use Database Vital Statistical System, the U.S. cancer mortality rates are 1997-2001 white population rates. Rates presented in this report are for the U.S. white population and were obtained using CDC Wonder.

U.S. INCIDENCE RATES

The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based

cancer registries and three supplemental registries covering approximately 26 percent of the US population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates.

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Cancer in Vermont: A report of 1997-2001 cancer incidence data from the Vermont Cancer Registry, Vermont Department of Health, Burlington, VT, 2005. This report can be made available in other accessible formats.

REFERENCES

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- Cancer Clusters Fact Sheet, National Institutes of Health, http://cis.nci.nih.gov/fact/3_58.htm.
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- NCI's Office of Cancer Survivorship. Estimated US Cancer Prevalence Counts: Who Are Our Cancer Survivors in the US? <http://cancercontrol.cancer.gov/ocs/prevalence/>.
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- Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 6.1.4.
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- Vermont Department of Health Vital Statistics System, 1997-2001.
- Vermont State Health Plan 2005, Vermont Department of Health, 2005.

MORE INFORMATION

U.S.

- American Cancer Society, www.cancer.org, 1-800-ACS-2345
- American Society of Clinical Oncology (ASCO) and People Living With Cancer www.oncology.com
- Centers for Disease Control and Prevention, www.cdc.gov/cancer
- National Center for Health Statistics, www.cdc.gov/nchswww/default.htm, 301-458-4636
- National Program of Cancer Registries, www.cdc.gov/cancer/npcr/index.htm 1-888-842-6355
- United States Cancer Statistics: 2001 Incidence, www.cdc.gov/cancer/npcr/uscs/index.htm
- Harvard Center for Cancer Prevention Your Cancer Risk, www.yourdiseaserisk.harvard.edu
- National Cancer Institute, www.cancer.gov/cancerinformation, 1-800-4CANCER
- Surveillance Epidemiology and End Results (SEER) Program, www.seer.cancer.gov
- North American Association of Central Cancer Registries, www.naaccr.org, 217-698-0800
- State Cancer Profiles, www.statecancerprofiles.cancer.gov
- U.S. Department of Health and Human Services Agency for Healthcare Research and Quality www.preventiveservices.ahrq.gov

VERMONT

- Vermont Vital Statistics <http://www.healthyvermonters.info/hs/vital/vitalhome.shtml> 802-863-7300
- Cancer Registration in Vermont, a detailed explanation of data collection standards and methods. www.state.vt.us/health/CancerRegistration.pdf

BREAST CANCER

- National Cancer Institute - Breast Cancer Home Page, www.cancer.gov/cancer_information/cancer_type/breast/
- Vermont Department of Health - Disease Control Bulletin Chronic Disease in Vermont: Breast Cancer Screening, www.healthyvermonters.info/dcb/092002.shtml#2

CERVICAL CANCER

- National Cancer Institute - Cervical Cancer Home Page, www.cancer.gov/cancerinfo/types/cervical

MORE INFORMATION

COLORECTAL CANCER

- National Cancer Institute - Colon and Rectal Cancer Home Page, www.cancer.gov/cancertopics/types/colon-and-rectal

LUNG CANCER

- American Lung Association, www.lungusa.org
- National Cancer Institute Lung Cancer Home Page, www.cancer.gov/cancer_information/cancer_type/lung/
National Lung Screening Trial, www.nci.nih.gov/NLST

MELANOMA

- National Cancer Institute - Melanoma Home Page
www.cancer.gov/cancer_information/cancer_type/melanoma/

NON-HODGKIN LYMPHOMA

- American Society of Hematology, www.hematology.org
- Leukemia and Lymphoma Society, www.leukemia-lymphoma.org
- National Cancer Institute - Lymphoma Home Page,
www.cancer.gov/cancer_information/cancer_type/lymphoma/

PROSTATE CANCER

- Prostate Cancer Foundation, www.prostatecancerfoundation.org
- Centers for Disease Control and Prevention Prostate Cancer Screening: A Decision Guide
www.cdc.gov/cancer/prostate/decisionguide/index.htm
- National Cancer Institute Prostate Cancer Home Page,
www.cancer.gov/cancer_information/cancer_type/prostate/

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AGE ADJUSTED CANCER INCIDENCE RATES, 1997-2001
per 100,000 population by site and gender

	Total		Total VT Rate	(95% CI)	VT New Cases per year	Male		Female			
	U.S. Rate	VT Rate				U.S. Rate	VT Rate	U.S. Rate	VT Rate		
All Sites	487.7	499.2	✕	(491.3, 507.1)	3,064	568.3	580.9	435.1	446.8	✕	
Oral Cavity/Throat	10.8	9.9		(8.9, 11.1)	62	15.9	14.9	6.6	5.9		
Esophagus	4.7	5.7	✕	(4.9, 6.6)	35	8.1	9.6	2.0	2.7		
Stomach	6.9	6.0		(5.2, 7.0)	37	10.2	8.9	4.5	3.6		
Colon and Rectum	54.4	58.8	✕	(56.1, 61.6)	359	64.4	67.0	46.8	53.1	✕	
Liver	4.4	3.5	★	(2.8, 4.2)	21	6.7	5.6	2.6	1.7	★	
Pancreas	10.9	11.1		(10.0, 12.4)	68	12.6	13.3	9.5	9.4		
Larynx	3.9	4.5		(3.8, 5.4)	28	6.8	7.9	1.5	1.9		
Lung	65.4	69.0	✕	(66.1, 72.0)	421	82.3	92.8	✕	53.5	52.3	
Melanoma of the Skin	21.4	25.3	✕	(23.6, 27.2)	157	26.3	30.1	✕	18.1	22.5	✕
Breast (female)	n/a	n/a		n/a	n/a	1.2	1.9	143.2	138.6		
Cervix	n/a	n/a		n/a	n/a	n/a	n/a	7.8	9.7	✕	
Uterus	n/a	n/a		n/a	n/a	n/a	n/a	26.6	30.8	✕	
Ovary	n/a	n/a		n/a	n/a	n/a	n/a	15.0	14.2		
Prostate	n/a	n/a		n/a	n/a	171.2	164.5	n/a	n/a		
Testis	n/a	n/a		n/a	n/a	6.5	7.8	n/a	n/a		
Bladder	23.2	25.3	✕	(23.6, 27.2)	154	41.2	43.6	10.2	12.6	✕	
Kidney	11.9	11.7		(10.5, 12.9)	72	16.5	16.3	8.2	7.9		
Brain/Nervous System	7.3	6.6		(5.8, 7.6)	41	8.8	8.3	6.1	5.1		
Thyroid	7.6	6.9		(6.0, 7.9)	43	4.1	3.6	11.1	10.1		
Hodgkin Lymphoma	3.0	3.3		(2.7, 4.0)	20	3.3	3.4	2.7	3.3		
Non-Hodgkin Lymphoma	20.3	20.6		(19.0, 22.3)	126	24.5	23.2	16.9	18.6		
Myeloma	5.3	4.1	★	(3.5, 4.9)	25	6.7	5.8	4.2	2.9	★	
Leukemia	13.0	13.1		(11.9, 14.5)	80	17.0	17.7	10.1	9.8		

★ statistically lower than the U.S. SEER white rate
✕ statistically higher than the U.S. SEER white rate

All rates are age-adjusted to the 2000 U.S. standard population and exclude basal cell and squamous cell skin cancers, and in situ (malignant but non-invasive) carcinomas except urinary bladder. Rates based on 5 or fewer are not individually calculated. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database. U.S. SEER rates are 1997-2001 white population incidence rates. Male and female incidence tables that include confidence intervals (95% CI) and Vermont cases per year can be found on pages 6 & 7.

AGE ADJUSTED CANCER MORTALITY RATES, 1997-2001

per 100,000 population by site and gender

	Total		(95% CI)	VT Deaths per year	Male		Female	
	U.S. Rate	VT Rate			U.S. Rate	VT Rate	U.S. Rate	VT Rate
All Sites	197.8	203.1 ✖	(198.1, 208.3)	1236	245.9	253.3	166.6	171.4
Oral Cavity/Throat	2.6	2.5	(1.9, 3.1)	15	3.9	3.8	1.6	1.6
Esophagus	4.2	4.6	(3.9, 5.5)	28	7.4	7.9	1.7	2.1
Stomach	4.1	3.7	(3.1, 4.5)	23	5.8	5.1	2.8	2.5
Colon and Rectum	20.4	22.1	(20.4, 23.8)	135	24.6	25.7	17.2	19.9 ✖
Liver	4.1	3.2 ★	(2.6, 4.0)	20	6.0	4.9	2.7	2.0
Pancreas	10.3	10.8	(9.7, 12.1)	66	12.0	13.5	9.0	8.9
Larynx	1.3	1.4	(1.0, 1.9)	9	2.3	2.5	0.5	0.5
Lung	55.9	55.4	(52.7, 58.1)	340	76.2	78.2	41.5	39.4
Melanoma of the Skin	3.0	3.0	(2.5, 3.8)	19	4.3	4.8	2.0	1.6
Breast (female)	n/a	n/a	n/a	n/a	n/a	n/a	26.5	27.7
Cervix	n/a	n/a	n/a	n/a	n/a	n/a	2.6	3.0
Uterus	n/a	n/a	n/a	n/a	n/a	n/a	3.9	5.0 ✖
Ovary	n/a	n/a	n/a	n/a	n/a	n/a	9.2	8.5
Prostate	n/a	n/a	n/a	n/a	28.9	30.4	n/a	n/a
Testis	n/a	n/a	n/a	n/a	0.3	n/a	n/a	n/a
Bladder	4.5	5.3	(4.5, 6.2)	32	7.9	8.3	2.3	3.5 ✖
Kidney	4.3	4.2	(3.5, 5.1)	26	6.2	7.1	2.8	2.1
Brain/Nervous System	4.9	4.4	(3.6, 5.2)	27	5.9	5.4	4.0	3.5
Thyroid	0.5	0.5	(0.3, 0.9)	3	0.5	2.0	0.5	2.0
Hodgkin Lymphoma	0.5	0.4	(0.2, 0.8)	3	0.6	n/a	0.4	0.5
Non-Hodgkin Lymphoma	8.7	9.3	(8.2, 10.5)	57	10.8	11.5	7.1	7.7
Myeloma	3.7	3.6	(3.0, 4.4)	22	4.6	3.9	3.1	3.3
Leukemia	7.9	7.8	(6.8, 8.9)	47	10.4	11.0	6.0	5.7

- ★ statistically lower than the U.S. white rate
- ✖ statistically higher than the U.S. white rate

All rates are age-adjusted to the 2000 U.S. standard population and exclude basal cell and squamous cell skin cancers. Rates based on 5 or fewer deaths are not individually calculated. The U.S. rates are based on the Vital Statistics System of the United States Public use database. U.S. rates are 1997-2001 white population mortality rates. Male and female mortality tables that include 95% CI and Vermont deaths per year can be found on page 8 and 9.